

At page 21, line 1 is amended as follows and as indicated in the marked up version included with this response as Attachment A:

A2

Table 3: Tails

In the Claims

Cancel claims 1-32 and 34-52, without prejudice.

Claim 33 is amended as follows and as indicated in the marked up version included with this response as Attachment A:

A3

33. (1<sup>st</sup> Time Amended) A composition comprising an SPC of claim 53 in a pharmaceutically acceptable carrier.

Claims 53-82 are added as follows and as indicated in the marked up version included with this response as Attachment A:

-- 53. A synthetic polymer complement ("SPC") comprising a crosslinked soluble three-dimensional polymeric network having a diameter less than about 1000 nm, and wherein the SPC comprises target binding sites on its surface, the target binding sites being complementary to at least a portion of the surface topology and force field of a target.

54. A synthetic polymer complement according to claim 53, wherein the SPC is capable of specific recognition of the target.

55. A synthetic polymer complement according to claim 53, wherein the target binding sites comprise three-dimensional cavities complementary to at least a portion of the surface topology and force field of the target.

56. A synthetic polymer complement according to claim 55, wherein the three-dimensional cavities retain their topological and force field complementarity to the target when they are not bound to the target.

57. A synthetic polymer complement according to claim 53, wherein the target is selected from the group consisting of organic compounds, toxins, pollutants, pathogens, synthetic drugs,

steroids and derivatives, proteins, glycoproteins, polysaccharides, lipids, lipopolysaccharides, polyanions including nucleic acid, porphyrins, substituted porphyrins, and active agents.

AY  
Cont'd

58. A synthetic polymer complement according to claim 53 wherein the polymeric network is comprised of monomers consisting of at least one crosslinking group and at least one head group, which is a functional group capable of undergoing a binding interaction with a site on the target.

59. A synthetic polymer complement according to claim 58 wherein the head group is selected from the group consisting of alcohols, carboxylic acids, amides, amines, phosphates, sulfonates, aromatic groups, sugars, disaccharides and polysaccharides.

60. A synthetic polymer complement according to claim 58 wherein the head group is a sugar, a protein, or a carbohydrate.

61. A synthetic polymer complement according to claim 58, wherein the crosslinking group is selected from the group consisting of acrylate, methacrylate, acrylamide, vinyl ether, epoxide, methacrylamide, vinylbenzene,  $\alpha$ -methylvinylbenzene, vinylbenzene, divinylbenzene, maleic acid derivative, diene, substituted diene, thiol, alcohol, amine, carboxylic acid, carboxylic anhydride, carboxylic acid halide, aldehyde, ketone, isocyanate, succinimide, carboxylic acid hydrazide, glycidyl ether, silane, siloxane, chlorosilane, alkoxysilane, alkyne, azide, 2'-pyridyldithiol, phenylglyoxal, iodo, maleimide, aryl halides, imidoester, dibromopropionate, and iodacetyl.

62. A synthetic polymer complement according to claim 58 wherein the crosslinking group is an acrylate, a methacrylate, an acrylamide, or a methacrylamide.

63. A synthetic polymer complement according to claim 58 wherein the polymeric network is further comprised of monomers consisting of a crosslinking group without a head group.

64. A synthetic polymer complement according to claim 63 wherein the crosslinking group is an acrylate, a methacrylate, an acrylamide, or a methacrylamide.

65. A synthetic polymer complement according to claim 58 wherein the polymeric network is further comprised of monomers consisting of a crosslinking group, a head group, and a tail region.

66. A synthetic polymer complement according to claim 65 wherein the tail region comprises a moiety selected from the group consisting of a poly(ethylene glycol), poly(ethylene oxide), poly(vinyl alcohol), poly(vinylpyrrolidone), poly(ethyloxazoline), poly(ethylene oxide)-co-poly(propyleneoxide) block copolymer, polysaccharide, a poly(amino acid), and a hydrocarbon moiety.

67. A synthetic polymer complement according to claim 53 wherein the target binding sites comprise a surface having at least one functional group capable of undergoing a binding interaction with a site on a target.

68. A synthetic polymer complement according to claim 53 which comprises from 1 to about 1000 target binding sites.

69. A synthetic polymer complement ("SPC") comprising a crosslinked soluble three-dimensional polymeric network having a diameter less than about 1000 nm, and wherein the SPC is capable of binding a target, and wherein the SPC is formed by:

providing a set of monomers, at least some of the monomers comprising i) at least one head group, which is a functional group capable of undergoing a binding interaction with a site on the target and ii) at least one crosslinking group, which is a reactive group capable of covalently reacting to crosslink monomers of the monomer set;

contacting the set of monomers with the target to permit the monomers to self assemble on the target;

reacting the crosslinking groups of the monomers of the monomer set; and

removing the target;

to form the SPC comprising one or more three-dimensional binding sites on its surface, the binding sites being complementary in shape to at least a portion of the surface of the target.

70. A synthetic polymer complement according to claim 69 wherein the head group is selected from the group consisting of alcohols, carboxylic acids, amides, amines, phosphates, sulfonates, aromatic groups, sugars, disaccharides and polysaccharides.

71. A synthetic polymer complement according to claim 69 wherein the head group is a sugar, a protein, or a carbohydrate.

72. A synthetic polymer complement according to claim 69, wherein the crosslinking group is selected from the group consisting of acrylate, methacrylate, acrylamide, vinyl ether, epoxide, methacrylamide, vinylbenzene,  $\alpha$ -methylvinylbenzene, divinylbenzene, maleic acid derivative, diene, substituted diene, thiol, alcohol, amine, carboxylic acid, carboxylic anhydride, carboxylic acid halide, aldehyde, ketone, isocyanate, succinimide, carboxylic acid hydrazide, glycidyl ether, silane, siloxane, chlorosilane, alkoxysilane, alkyne, azide, 2'-pyridyldithiol, phenylglyoxal, iodo, maleimide, aryl halides, imidoester, dibromopropionate, and iodacetyl.

73. A synthetic polymer complement according to claim 69 wherein the crosslinking group is an acrylate, a methacrylate, an acrylamide, or a methacrylamide.

74. A synthetic polymer complement according to claim 69 wherein the set of monomers further comprises monomers consisting of a crosslinking group without a head group.

75. A synthetic polymer complement according to claim 74 wherein the crosslinking group is an acrylate, a methacrylate, an acrylamide, or a methacrylamide.

76. A synthetic polymer complement according to claim 58 wherein the set of monomers further comprises monomers consisting of a crosslinking group, a head group, and a tail region.

77. A synthetic polymer complement according to claim 76 wherein the tail region comprises a moiety selected from the group consisting of a poly(ethylene glycol), poly(ethylene oxide), poly(vinyl alcohol), poly(vinylpyrrolidone), poly(ethyloxazoline), poly(ethylene oxide)-co-poly(propyleneoxide) block copolymer, polysaccharide, a poly(amino acid), and a hydrocarbon moiety.

78. A synthetic polymer complement according to claim 69 wherein the set of monomers further comprises a non-ionic surfactant.

79. A synthetic polymer complement according to claim 69 wherein at least some of the monomers are amphiphilic.

80. A synthetic polymer complement according to claim 69 wherein at least some of the monomers comprise a carbohydrate moiety.